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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

REGENTS OF THE UNIVERSITY OF MINNESOTA,

Plaintiff,

vs.

LSI CORPORATION and AVAGO TECHNOLOGIES U.S. INC.,

Defendants.

Case No.: 5:18-cv-00821-EJD-NMC

Plaintiff's Memorandum of Law in Opposition to Defendants' Motion for Summary Judgment

Date: December 12, 2024
Time: 9:00 am
Courtroom: 4

Hon. Edward J. Davila
Trial Date: March 25, 2025

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PLAINTIFF'S MEMORANDUM OF LAW IN OPPOSITION TO DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

Plaintiff UMN files this Opposition to Defendants' ("LSI") Motion for Summary Judgment ("Motion," filed under seal as attachment to Dkt. 315).

I. INTRODUCTION

UMN asserts that LSI infringes the methods of claims 14 and 17 ("Asserted Claims") of U.S. Patent No. 5,859,601 ("'601 Patent") through use of [redacted] UMN does not accuse other [redacted] of infringement. *See* Dkt. 321-3, JSUF ¶ 9. Correspondingly, "[u]se of [hard disk drives] that are not configured to use [redacted] do not directly infringe when used as configured." *Id.* ¶ 10.

LSI warps the uncontroversial proposition that a method is infringed only when practiced beyond all recognition in its Motion, grafting onto it a slew of conclusions that simply do not follow. LSI hyper-focuses on a narrow sliver of the case (end user use of HDDs incorporating Accused Read Channels), while pretending huge swathes of its own and its HDD-manufacturer customers' uses of [redacted] do not exist. Indeed, LSI makes not even a single, passing mention of the undisputed fact that LSI engages in an "extensive design, development, and sales cycle to sell their SoCs [systems-on-a-chip]." *Id.* ¶ 13. During that year-plus "sales cycle," [redacted] countless times in the United States and specifically [redacted] LSI's Motion fails to contend at all with that direct and indirect infringement. As a result, LSI's Motion misses entirely the heart of UMN's case. And LSI's sweeping request that this Court dismiss with prejudice UMN's entire case is based on no more than a strawman. LSI's Motion should be denied.

First, LSI's bid to erase any direct infringement fails because it (i) ignores entirely the extensive direct infringement it and its customers engage in throughout the sales cycle, (ii) levies unavailing procedural arguments against UMN's timely theory on why LSI's [redacted] infringes, and (iii) disregards extensive record evidence of use of the infringing code in the U.S.

Second, LSI fails to avoid indirect and willful infringement liability as a matter of law because (i) the facts demonstrate LSI had the requisite state of mind to support findings of indirect

and willful infringement, and state of mind is a classic jury question, and (ii) Federal Circuit law is clear that LSI cannot avoid contributory infringement just because LSI's [redacted] can be configured in a non-infringing manner.

Third, LSI's claim that UMN is entitled to no damages ignores the facts of infringement, misconstrues UMN's damages theory, and ignores case law approving UMN's use of non-infringing sales as a metric to value of LSI's infringing uses of the Asserted Claims.

Finally, LSI's arguments that the '601 Patent does not enable the full scope of the Asserted Claims fail to apply the governing legal standard, under which a jury has ample grounds to find the claims enabled, in light of the state of the art and knowledge of a person of skill in the art ("POSITA"). Disputes on those factual issues preclude summary judgment.

II. LEGAL STANDARD

"[A] Court may grant summary judgment only when the moving party shows there is no genuine dispute of material fact." *Applied Materials, Inc. v. Demaray LLC*, 5:20-cv-09341, 2024 WL 37218, at *2 (N.D. Cal. Jan. 2, 2024) (Davila, J.). "The moving party bears the burden of persuading the Court that there is no genuine dispute of material fact" and "the initial burden of producing evidence that demonstrates there is no dispute." *Id.* "If the moving party satisfies this initial burden, the nonmoving party can nonetheless defeat summary judgment by showing the evidence, taken as a whole, could lead a rational trier of fact to find in its favor." *Id.* "Reasonable doubts as to the existence of material factual issue are resolved against the moving parties and inferences are drawn in the light most favorable to the non-moving party." *Addisu v. Fred Meyer, Inc.*, 198 F.3d 1130, 1134 (9th Cir. 2000). "[W]here evidence is genuinely disputed on a particular issue—such as by conflicting testimony—that issue is inappropriate for resolution on summary judgment." *Fuller v. Idaho Dep't of Corr.*, 865 F.3d 1154, 1161 (9th Cir. 2017).

III. ARGUMENT

A. LSI's Arguments Ignore the Fundamental Facts of this Case

In its Motion, LSI fixates on end user use of HDDs sold by LSI's customers. On the very first page of its Motion, LSI baldly—but incorrectly—asserts that "for there to be infringement under UMN's theory, a third-party HDD manufacturer would have to configure the LSI SoC in a

specific way, and then someone would need to use an HDD containing that SoC to record data to the disk." Mot. at 1. In other words, LSI pretends that LSI's commercially available read channel SoCs and its customers' commercially available HDDs into which the SoCs are incorporated simply spring, fully formed, from the ether. And LSI pretends that the subsequent operation of those HDDs by end users is the first time the methods of the Asserted Claims are used.

This could not be further from the truth. It is an ***undisputed fact*** that "LSI engages [in] an extensive design, development, and sales cycle to sell their SoCs." JSUF ¶ 13. During that sales cycle, [redacted] As relevant here, LSI and its customers made countless uses of the methods of the Asserted Claims during the sales cycle. Yet, LSI makes not a single reference to this sales cycle in its Motion. This fundamental defect results in LSI's Motion ignoring the realities of the industry in which LSI operates and grossly misrepresenting UMN's theories of the case. Properly identifying infringing uses of the Asserted Claims in the context of the sales cycle, which LSI fails to do, is critical to understanding UMN's infringement and damages theories and is fatal to LSI's Motion.

1. Uses of the Asserted Claims During LSI's Sales Cycle

The Asserted Claims are method claims. Thus, the act of direct infringement is ***use*** of the method, not the sale of an apparatus or product capable of performing the method. *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 773 (Fed. Cir. 1993). UMN asserts that LSI infringes in three ways:

- LSI directly infringes when it ***uses*** the Asserted Claims in the U.S. (35 U.S.C. § 271(a));
- LSI induces infringement when LSI's customers (and their customers) ***use*** the Asserted Claims in the U.S. pursuant to LSI's directions (35 U.S.C. § 271(b)); and
- LSI engages in contributory infringement by selling SoCs that LSI's customers and their customers ***use*** to practice the Asserted Claims (35 U.S.C. § 271(c)).

While LSI focuses on end user operation of HDDs, LSI and its customers (not downstream users) infringe during the "extensive design, development, and sales cycle," in which they engage for every generation of SoCs sold. JSUF ¶ 13. UMN's industry expert described this "sales cycle" in detail,

and LSI's competing industry expert confirmed those descriptions. Ex. 1, Expert Report of Dr. Christopher H. Bajorek, ¶¶ 153-284; Ex. 2, Deposition Transcript of Donald Adams, 82:21-83:1.

LSI's sales cycle begins with LSI [redacted] *See* Ex. 1 ¶ 210. [redacted] *Id.* ¶¶ 205, 207. [redacted] *Id.* ¶¶ 242-43. Only after those steps are completed does [redacted] *Id.* ¶ 285. As detailed below, at each step of the sales cycle, LSI used the methods of the Asserted Claims. LSI ignores each of those infringements in its Motion.

a. LSI's Internal Development

LSI's sales cycle begins with [redacted] *Id.* ¶¶ 210, 214. This involves an extensive internal process, including design work and internal analyses. *Id.* [redacted] *Id.* ¶¶ 218-19. [redacted] *Id.* ¶¶ 225-26. [redacted] *See, e.g.*, Ex. 3, Deposition Transcript of Yuan Xing Lee, 29:21-30:23 [redacted] Ex. 4, Deposition Transcript of Bruce Wilson, 90:17-91:5 [redacted] UMN asserts that LSI directly infringed the Asserted Claims during this internal development, when [redacted] *See* Ex. 5, Declaration of Prof. Steven McLaughlin, ¶¶ 4.3, 8.23, 8.40.

b. LSI's Work With HDD Manufacturers

Once LSI has [redacted]

[redacted] Ex. 1 ¶ 205. [redacted]

[redacted] *Id.* ¶ 230. [redacted]

[redacted]

[redacted] *Id.* ¶¶ 231-32. [redacted]

[redacted]

[redacted] *Id.* ¶ 236. [redacted]

[redacted]

[redacted] *Id.* [redacted]

[redacted]

[redacted] *Id.* ¶¶ 230, 241. UMN asserts that LSI (i) directly infringed the Asserted Claims when [redacted] and (ii) indirectly infringed the Asserted Claims when it [redacted]. Ex. 5 ¶¶ 6.100-6.138, 8.23-8.40.

If LSI [redacted]

[redacted] Ex. 1, ¶ 207. [redacted] LSI and its customer [redacted]

[redacted] *Id.* ¶¶ 176-77, 263, 265. Throughout that process, LSI's Field Application Engineers ("FAEs") [redacted]

[redacted] *Id.* ¶¶ 176-77, 238-40, 258. As part of this work, FAEs [redacted]

[redacted]

[redacted]

[redacted] Ex. 6, Deposition Transcript of Kenneth Tarver, 27:7-16, 105:15-20. [redacted]

[redacted] Ex. 1 ¶¶ 241, 248, 262; Ex. 6 at 35:11-45:6. In the course of this work, LSI again (i) directly infringed the Asserted Claims when [redacted] and (ii) indirectly infringed the Asserted Claims when it encouraged and provided assistance to its customers [redacted]. Ex. 5 ¶¶ 8.23-8.40.

[redacted] LSI uses [redacted] Ex. 1 ¶¶ 246-47. LSI and its customers [redacted] *Id.* ¶¶ 253-54. The final step of the sales cycle is [redacted] *Id.* ¶¶ 269, 71. [redacted] infringe the Asserted Claims when [redacted] Ex. 5 App'x C. Once [redacted] Ex. 1 ¶¶ 194, 275.

2. LSI's Adoption of Infringing MTR Code

LSI's failure to address the role of its sales cycle obscures the extensive direct and indirect infringement that LSI engages in before its SoCs become commercially available. That same failure also obscures the key question of ***why*** LSI incorporated [redacted] into its read channel SoCs in the first place. The answer to this question sheds substantial light on the damages LSI owes to UMN for its infringing uses.

LSI developed the infringing [redacted] As HDD manufacturers sought to achieve increasing data capacity in the face of significantly slowed HDD head and media improvements, [redacted] Ex. 7, Expert Report of Catharine Lawton, ¶ 202. [redacted]

[redacted] Ex. 1 ¶¶ 78, 135. [redacted]

[redacted] *Id.* ¶ 78. [redacted]

[redacted]

[redacted] *Id.* [redacted]

[redacted]

[redacted]

[redacted] *Id.* ¶¶ 127-28; *see also* Ex. 7 ¶¶ 227, 229, 231.

[redacted]

[redacted] Ex. 1 ¶¶ 140-41. [redacted]

[redacted]

[redacted]

[redacted]

[redacted] *Id.* ¶¶ 131-32. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] *Id.* ¶¶ 133, 135, 137.

[redacted]

[redacted] *See id.* ¶¶ 139-42. [redacted]

[redacted]

[redacted] Ex. 8, P-30, at 3. [redacted]

[redacted]

[redacted] *Id.* [redacted]

[redacted]

[redacted] *Id.* [redacted]

[redacted]

[redacted] *Id.* at 6.

Rather than address that evidence, LSI erroneously suggests the infringing [redacted] had little value by repeatedly harping on its contention that only one HDD manufacturer "ever selected [redacted] for any HDD product" it commercially released. Mot. at 1. LSI's actions, however, speak louder that its post-hoc litigation position. LSI spent immense time and resources on developing and implementing [redacted] Throughout the damages period (2010-2016), LSI [redacted] *See* Ex. 1 ¶ 295; Ex. 7 ¶¶ 820-42. Indeed, [redacted] Ex. 9, LSI-UMN 00229290. Common sense dictates that a sophisticated company like LSI would take such actions only for technology valuable to it. And the record reflects that that is precisely what the methods of the Asserted Claims were.

3. UMN's Damages Model

UMN's damages theory stems directly from the valuable nature of the infringing uses of the Asserted Claims during LSI's sales cycle. UMN seeks damages for LSI's (i) own direct infringement in the form of infringing uses of the Asserted Claims throughout the sales cycle, and (ii) indirect infringement, both contributory and induced (not only of end users of HDDs incorporating LSI's chips, but also of HDD manufacturers during the competitive bid selection process and customization work in the sales cycle). Pursuant to 35 U.S.C. § 284, UMN is entitled to damages adequate to compensate it for ***all*** of LSI's infringement and is "guarantee[d]" no less "than a reasonable royalty for the ***use*** made of the invention by the infringer." *Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd. ("CMU")*, 807 F.3d 1283, 1303-04 (Fed. Cir. 2015) (emphasis added).

To determine a "reasonable" royalty, *i.e.*, a royalty that reflects the value of LSI's

infringement of the Asserted Claims, UMN relies on the established methodology of a hypothetical negotiation, applying the *Georgia-Pacific* factors. *See i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 854 (Fed. Cir. 2010), *aff'd*, 564 U.S. 91 (2011); *CMU*, 807 F.3d at 1303-04; *see also* Ex. 7 ¶¶ 935-51. Under that construct, LSI's read channel SoC sales—which themselves are not infringing, since method claims are infringed by use—and the resulting revenue function as a ***metric*** to value LSI's and its customers' valuable uses of the Asserted Claims during the sales cycle. Those sales cycle uses result in design wins and volume production of SoCs. Ex. 1 ¶ 286. Accordingly, UMN's damages expert opines that in the hypothetical negotiation, UMN and LSI would have agreed to a running royalty or a lump sum payment that is [redacted] during the sales cycle. Ex. 7 ¶¶ 30, 1004.

B. LSI Fails to Establish No Infringement as a Matter of Law.

As detailed above, LSI's Motion is most notable for what it fails to address. Those omissions doom LSI's arguments regarding direct, induced, and contributory infringement and willfulness.

1. LSI Fails to Account for the Vast Majority of Infringement at Issue.

LSI avoids addressing the bulk of the infringement at issue in this case. Indeed, LSI attempts to erase any direct infringement liability exposure by focusing solely on whether end user use of HDDs sold by LSI's customers would infringe or not. *See, e.g.* Mot. at 1, 11-12, 20-21. But this downstream use of commercial products is just a small sliver of the case.

UMN's experts defined the term "Accused Products" to encompasses both "Accused Simulators" and "Accused Read Channels." As described *supra*, Accused Simulators are used extensively by both LSI and its customers during the sales cycle, with substantial evidence demonstrating that LSI and its customers [redacted] "Accused Read Channels," in turn, include not just the commercially available read channel SoCs incorporated by LSI's customers into their HDDs, but also, as detailed *supra*, [redacted] Again, record evidence demonstrates that, during the sales cycle for the SoCs incorporating the Accused Read Channels, LSI and its customers [redacted] *See*

supra at §III.A.1.

2. Whether [redacted] nfringes Is a Hotly Disputed Issue of Fact.

LSI's only argument that impacts direct infringement during the sales cycle is its erroneous assertion that the Court can find that [redacted] does not infringe as a matter of law. Mot. at 11-14. Whether that code infringes the Asserted Claims is hotly contested. *Compare* Ex. 5 ¶¶ 6.20-6.138, App'x C *with* Ex. 10, Rebuttal Expert Report of Koralek, ¶ 96. That disputed issue of fact precludes LSI's request for summary judgment.

LSI begins by incorrectly claiming that "UMN's own [infringement] contentions demonstrate non-infringement," when they do precisely the opposite. Mot. at 11. LSI quotes UMN's contentions as to Claim 13 (which is no longer in the case), *id.*, while ignoring entirely what UMN said about the Asserted Claims. In its contentions, UMN explained that LSI infringed the Asserted Claims:

[redacted]

Ex. 11 at Ex. A, p.12. That is, UMN specifically identified [redacted] *Id.*

LSI next demands that the Court "disregard" UMN's supposed "new infringement theory," which LSI describes as being based upon [redacted] Mot. at 12. But that is the ***same theory*** UMN disclosed in its supplemental infringement contentions. There, UMN asserted that [redacted] Just because UMN, through Prof. McLaughlin's infringement report, expanded upon the description in its infringement contentions with additional detail and further record citations does not mean it presented a "new infringement theory." *See Digital Reg of Tex., LLC v. Adobe Sys. Inc.*, 12-01971-CW (KAW), 2014 WL 1653131, at *5 (N.D. Cal. Apr. 24, 2014) ("That the expert report includes information outside of the infringement

contentions, without altering the disclosed theory of infringement, is to be expected."); *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 5:12-cv-0630-LHK-PSG, 2014 WL 12917334, at *1 (N.D. Cal. Jan. 9, 2014) ("The scope of contentions and expert reports are not … coextensive"); *Finjan, Inc. v. Blue Coat Sys., Inc.*, 13-cv-03999-BLF, 2015 WL 3640694, at *3 (N.D. Cal. June 11, 2015) (denying motion to strike where "Plaintiff's expert report merely elaborates on the manner in which DRTR allegedly infringes and does not amount to a last-minute disclosure of a new infringement theory").

LSI's claim that UMN's infringement theory applies some new claim construction, Mot. at 12, also fails because that theory and Prof. McLaughlin's exposition of it are consistent with the governing claim constructions for "encoded waveform" and "recorded waveform." The parties agreed to construe "recorded waveform" with its plain and ordinary meaning, and the Court construed "encoded waveform" to mean "recorded waveform." Dkt. 240 at 2; Dkt. 263 at 12. UMN's infringement theory applies both recorded waveform's plain and ordinary meaning and the language of the '601 Patent.[1] As Prof. McLaughlin explained in his report, Ex. 5 ¶¶ 6.75-6.84, 8.9-8.13, in the following LSI diagram, [redacted] is a waveform that is recorded, which is the plain and ordinary meaning of "recorded waveform."

[redacted]

[1] Because recorded waveform carries its plain and ordinary meaning, LSI's cases (Mot. at 13-14), which deal with experts deviating from specific non-plain and ordinary meaning claim constructions, are inapposite. *See Applied Materials*, 2024 WL 37218, at *4 (construction of "pulse" required oscillation, but patent owner argued oscillation was not required); *Treehouse Avatar LLC v. Valve Corp.*, 54 F.4th 709, 715 (Fed. Cir. 2022) (parties agreed to specific non-plain and ordinary construction, from which party's expert departed).

Claim 13, from which the Asserted Claims depend, further specifies that the recorded waveform at issue is made up of multiple codewords encoded from datawords. '601 Patent at col. 10:46-47 ("A method of encoding m-bit binary datawords into n-bit binary codewords in a recorded waveform …"). [redacted][2]

Indeed, LSI's technical expert, Dr. Koralek, agreed with each step of Prof. McLaughlin's infringement analysis, and ultimately conceded Prof. McLaughlin's interpretation was at least a "hypothetical possibility," even though he disagreed with Prof. McLaughlin's ultimate conclusion. *See* Ex. 12 at 21, 113-19, 125, 129, 131. That disagreement "amount[s] to a 'battle of the experts' over material facts, precluding summary judgment." *NetFuel, Inc. v. Cisco Sys. Inc.*, 438 F. Supp. 3d 1031, 1038-39 (N.D. Cal. 2020) (Davila, J.); *see also B-K Lighting, Inc. v. Fresno Valves & Castings, Inc.*, 375 F. App'x 28 (Fed. Cir. 2010) ("[T]he conflicting testimony of the parties' experts…created a genuine issue of material fact"). This Court should reject LSI's attempts to distract from that reality by ginning up erroneous procedural challenges to UMN's infringement theory and Prof. McLaughlin's opinions, as further detailed in UMN's opposition to LSI's motion to strike portions of Prof. McLaughlin's report.

3. LSI Used the Asserted Claims in the U.S.

In keeping with its studied effort to avoid any mention of the bulk of infringement at issue,

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[2] In fact, LSI improperly attempts to rewrite the construction of "recorded waveform" to avoid the consequences of its infringement. To argue non-infringement, LSI claims that [redacted] But there is no support for this. ***Nowhere*** in the claims, the '601 Patent, or its file history are [redacted] even mentioned, nor do [redacted] appear in the dictionary definitions of "recorded waveform," "recorded," or "waveform." LSI's own initial proposed construction for "recorded waveform"—"the sequences of n-bit codewords that are recorded as symbols / patterns in a medium"—makes no mention of [redacted] and in fact reads directly onto the [redacted] UMN identifies as the "recorded waveform." Dkt. 240 at 2.

LSI tries to deny liability on a geographic basis by claiming (i) that UMN failed to provide "proof that any infringing HDDs (or simulators) configured to enable the [redacted] were ever used *in the United States*," and (ii) that "UMN cannot show that LSI *knew* that its customers were importing into the United States" HDDs with [redacted]. Mot. at 14, 17.

LSI's contentions, which again ignore the role of the sales cycle at the heart of this case, are beside the point and would not absolve LSI of liability. LSI and its customers indisputably made repeated use of the Asserted Claims during the sales cycles ***in the U.S.*** UMN has presented extensive evidence demonstrating that LSI and its customers [redacted] in the U.S. at every stage of LSI's extensive sales cycle. *See supra* at § III.A.1. What follows is just a small sample of the evidence of U.S. use in this case:

- [redacted] Ex. 4, 28:4-29:9, 105:19-109:19, 133:22-135:9, 145:16-147:18;
- [redacted] Ex. 13, Deposition Transcript of Shaohua Yang, 72:11-73:11, 96:7-97:16;
- [redacted] Ex. 6, 35:11-25, 39:3-7, 42:10-24, 44:3-20; *see also id.* 169:6-172:16 [redacted]
- Prof. McLaughlin outlined in his infringement report the manner in which the Accused Simulators and Accused Read Channels infringe, with citation to LSI documents generated by or reporting on activity by the U.S.-based read channel architecture team, Ex. 5 § 6;

- UMN's industry expert, Dr. Christopher Bajorek, identified at what phases of the sales cycle the infringement to which Prof. McLaughlin opined took take place, opined based on LSI's documents and testimony that those sales cycle uses occur in the U.S., and submitted appendices listing exemplary sets of LSI documents reflecting that U.S. sales cycle [redacted] Ex. 1 ¶¶ 32, 72-77, 210-89, 302-03, 316, App'xs C, D;
- LSI's own industry expert confirmed that [redacted] Ex. 2, 158:23-159:7.

In the face of that overwhelming evidence of U.S. infringement by LSI and its customers during the sales cycle, LSI incredibly, and wrongly, asserts that UMN has a "complete failure of proof" that any "simulators" "configured to enable [redacted] were ever used *in the United States*." Mot. at 14. But its only cite in support of that outlandish assertion is a few lines of testimony from Prof. McLaughlin directed solely at the fact that he had not reviewed evidence, one way or the other, about the location of ***downstream*** HDD use, not simulator use. *Id.* Thus, UMN's evidence of direct infringement in the U.S. by LSI and its customers is essentially uncontested.

Moreover, for inducement, LSI cannot meaningfully deny (i) knowing its customers used the [redacted] during the sales cycle in their U.S. facilities and (ii) encouraging that use. As detailed above, LSI [redacted] in the U.S. throughout the sales cycle to assist with [redacted] *Supra* at § III.A.1. It is ***undisputed*** that "LSI's field application engineers [redacted]" and [redacted] that LSI provides to LSI Customers [redacted] JSUF ¶¶ 40-41. LSI cannot pretend it knew nothing of U.S. use, when it directly provided [redacted] to its customers on how to operate in [redacted] and received from customers [redacted] generated in the U.S. *See, e.g.*, Ex. 6, 166:4-168:17;

Ex. 14, LSI-UMN 00229898.[3]

4. LSI's State of Mind Is a Hotly Disputed Issue of Fact.

LSI's attempt to defeat UMN's indirect and willful infringement claims by arguing UMN cannot establish the requisite state of mind fails on the law and the facts. *See* Mot. at 15-20.

LSI's convoluted recitations of the governing law wrongly suggest UMN is subject to a far stricter standard than the law actually requires. Liability for induced and contributory infringement attaches where the defendant "knew of the patent" and knew the acts in question "constitute patent infringement." *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 639 (2015). That intent "may be inferred from all of the circumstances." *Broadcom Corp. v. Qualcomm Inc.*, 543 F.3d 683, 699 (Fed. Cir. 2008). Both the components of the "intent" element "can be established by a proper finding of 'willful blindness,'" *i.e.*, being willfully blind both to the existence of the patent and to the fact that the acts it is inducing or contributing to infringe. *Roche Diagnostics Corp. v. Meso Scale Diagnostics, LLC*, 30 F.4th 1109, 1117-18 (Fed. Cir. 2022); *Info-Hold, Inc. v. Muzak LLC*, 783 F.3d 1365, 1372 (Fed. Cir. 2015). "Willful blindness, in turn, is characterized by two basic requirements: (1) [t]he defendant must subjectively believe that there is a high probability that a fact exists and (2) the defendant must take deliberate actions to avoid learning of that fact." *Roche Diagnostics*, 30 F.4th at 1118 (citing *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 769 (2011)). In addition, "courts have recognized that … willful blindness can satisfy the knowledge requirement for willful infringement." *Corephotonics, Ltd. v. Apple, Inc.*, 17-CV-06457, 18-CV-02555, 2018 WL

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[3] Even LSI's besides-the-point contention that it had no idea that HDDs with [redacted] enabled ended up in the U.S. rings hollow. Those HDDs include, for example, [redacted] JSUF ¶ 11. [redacted] is a U.S. company, with its headquarters and design center in [redacted] and significant sales in the relevant period. Ex. 1 ¶ 75; Ex. 15, Deposition Transcript of David Grace, 378:16-381:11; Ex. 16, LSI-UMN 00455945. A jury could conclude, from circumstantial evidence, that LSI in fact was aware of the existence of HDD end users for the relevant HDD generations in the U.S.

4772340 (N.D. Cal. Oct. 1, 2018). Indeed, for willful infringement, "subjective willfulness alone – *i.e.*, proof that the defendant acted despite a risk of infringement that was 'either known ***or so obvious that it should have been known*** to the accused infringer' – can support an award of enhanced damages." *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1371 (Fed. Cir. 2017) (quoting *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 101 (2016) (emphasis added)).

LSI relies heavily on the fact that [redacted] JSUF ¶¶ 23-24; Mot. at 15. But nowhere in the governing legal standard is such [redacted] required. LSI ignores the extensive evidence that it was, at a minimum, willfully blind to the '601 Patent and its infringement.

It is undisputed, for instance, that several key members of the team that developed [redacted] knew that Prof. Moon and Dr. Brickner invented the MTR codes (of which [redacted]. JSUF ¶¶ 27-33. [redacted] *Id.* ¶¶ 28-30. That paper specified that [redacted] and in support, cited a 1996 IEEE paper by Prof. Moon and Dr. Brickner. *Id.* ¶ 31. [redacted] *Id.* ¶ 33. In other words, LSI was well aware that it was implementing and deploying in its products technology invented by Prof. Moon and Dr. Brickner.

Nor can LSI hide behind the fact that its engineers' references were not to the '601 Patent specifically. In January 2014, a patent examiner expressly cited the '601 Patent during the examination of LSI's U.S. Patent No. 8,730,067. *Id.* ¶ 39. And [redacted], LSI [redacted] from which, at a minimum, it should have understood that the

'601 Patent existed and LSI used the invention it claimed. Specifically, [redacted] *Id.* ¶ 34. [redacted] Ryan Phillips, Senior IP counsel for LSI who managed litigation and licensing negotiations. *Id.* ¶¶ 35-36. Subsequently, [redacted] *Id.* ¶ 37. [redacted] *Id.* ¶ 38. Mr. Nugent testified at his deposition that [redacted] Ex. 17, Deposition Transcript of Dale Nugent, 61:4-65:25. A jury could reasonably conclude that, as an IP lawyer, Mr. Phillips [redacted] Indeed, Mr. Phillips's [redacted] indicates he understood a patent existed. In other words, Mr. Phillips took deliberate action to avoid expressly confirming the existence of the '601 Patent and LSI's infringement. And he was not the only one burying his head in the sand; Dr. Wilson testified that [redacted] Ex. 4, 245:12-18.

Facts like these are sufficient for a reasonable jury to find the requisite intent, which precludes summary judgment. *See, e.g.*, *Intel Corp. v. Future Link Sys., LLC*, 268 F. Supp. 3d 605 (D. Del. 2017) (denying summary judgment of non-willfulness in light of, *inter alia*, "the lack of evidence of [defendant] ever investigating if its products infringed," its "corporate atmosphere encouraging employees to 'turn a blind eye' to patents," its "motivation to infringe, [and] the lengthy period during which infringement has continued"); *OpenTV, Inc. v. Apple, Inc.*, 14-cv-01622, 2015 WL 1535328 (N.D. Cal. Apr. 6, 2015) (finding it plausible to infer knowledge of patent based on patent being "identified to [defendant] during prosecution of [defendant's patents]"); *Motiva Patents,*

LLC v. Sony Corp., 408 F. Supp. 3d 819, 838 (E.D. Tex. 2019) (finding it plausible to infer willful blindness based on a corporate "policy or practice of not reviewing the patents of others," as that constitutes a specific kind of "deliberate action [] to avoid learning of potential infringement").

LSI attempts to negate its intent by arguing that LSI "reasonably believed that use of its chips does not impose a 'j' constraint less than 10 as required by" the Asserted Claims and so could not have the specific intent to infringe. Mot. at 15. This argument is flawed for numerous reasons. ***First***, as a legal matter, the notion that indirect infringement requires both ***specific*** knowledge of the limitations of particular patent claims and ***specific*** intent to infringe them ignores the willful blindness standard. *TecSec, Inc. v. Adobe Inc.*, 978 F.3d 1278, 1286 (Fed. Cir. 2020) ("The intent standard focuses on, and can be met by proof of, the defendant's subjective state of mind, whether actual knowledge or the subjective beliefs (coupled with action to avoid learning more) that characterizes willful blindness."). Requiring a defendant to have specific intent to practice the limitations of particular patent claims would eviscerate willful blindness, which by definition occurs when the defendant purposefully avoids learning what those limitations are so as to avoid forming that specific intent. ***Second***, LSI's assertion regarding what LSI supposedly believed is nothing more than bare attorney argument. LSI does not cite to any testimony or any declaration or affidavit suggesting anyone at LSI at the time of infringement actually held any such belief regarding the 'j' constraint [redacted] ***Third***, the only record cite LSI points to (Table 201 from LSI's technical specifications) just as readily supports an inference of specific intent as negates it; [redacted] ***Finally***, LSI's reliance on its litigation-driven non-infringement theory is misplaced given intent is subjective. "The subjective willfulness of a patent infringer … may warrant enhanced damages, without regard to whether his infringement was objectively reckless." *Halo*, 579 U.S. at 105; *see also Roche Diagnostics*, 30 F.4th at 1119 (noting inducement's intent standard "rest[s] on the subjective intent of the accused infringer"). LSI's own executives repeatedly identified [redacted] invented by Prof. Moon and Dr. Brickner, indicating subjective intent to practice [redacted] And at the time of LSI's infringement, all claims of the '601 Patent were still intact.

This included claim 13, which has no upper *j* constraint and so is unimpacted by a non-infringement theory based on a *j* constraint of over 10. LSI should not now be permitted to deploy its ex-post-facto non-infringement theory to override the record evidence of its subjective intent.

Ultimately, LSI's intent is a classic question of fact for the jury. *Fuji Photo Film Co. v. Jazz Photo Corp.*, 394 F.3d 1368, 1378 (Fed. Cir. 2005) (declining to disturb verdict because intent to induce infringement "is a factual determination particularly within the province of the trier of fact"); *Exmark Mfg. Co. Inc. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1353 (Fed. Cir. 2018) ("[T]he entire willfulness determination is to be decided by the jury"); *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1341 (Fed. Cir. 2016) (confirming that "the established law that the factual components of the willfulness question should be resolved by the jury" remains unchanged after *Halo*). LSI's motion for summary judgment based on a lack of intent to infringe should be denied.[4]

5. LSI Cannot Defeat Contributory Infringement Liability as a Matter of Law.

LSI's attempt to avoid contributory infringement by arguing the Accused Read Channels supposedly have "substantial noninfringing uses" (Mot. at 19) is legally and factually unsupported.

In *Fujitsu Ltd. v. Netgear Inc.*, the Federal Circuit held that under the appropriate analysis of substantial non-infringing uses, "the component at issue … is the specific hardware and software that performs" the infringing act in question. 620 F.3d 1321, 1330 (Fed. Cir. 2010). Even if the tool in which that hardware and software is embedded has multiple settings, many of which do not infringe, and "a user can turn off the infringing features," this does not establish substantial non-infringing uses. *Id.* at 1330-31. Indeed, the component at issue "does not have substantial noninfringing uses" where "when activated, the product is infringing." *Id.* at 1331; *see also Koninklijke Philips N.V. v. Zoll Med. Corp.*, 656 F. App'x 504, 524 (Fed. Cir. 2016) ("[T]he accused contributory infringer is not permitted to escape liability as a contributory infringer merely by embedding [the apparatus] in a larger product with some additional, separable feature … [W]e have sought to determine whether the infringing component is separate and distinct from other functions

[4] The failure of LSI's arguments on knowledge and intent likewise doom its claim that UMN is not entitled to damages for SoCs LSI supposedly sold without knowledge or intent. Mot. at 21-22.

of the composite product. … [W]e have generally been fairly liberal in finding the accused components separate." (internal quotations and citations omitted)); *PersonalWeb Techs. LLC v. Int'l Bus. Machines Corp.*, 16-CV-01266-EJD, 2017 WL 2180980, at *18 n.16 (N.D. Cal. May 18, 2017) ("The Court also disagrees that 'server-side deduplication' indisputably shows that there are non-infringing uses. The proper question under § 271(c) is whether there are non-infringing uses for the accused feature ('client-side deduplication'), not the multi-featured product as a whole …").

Here, it is undisputed that (i) all of the Accused Read Channels [redacted] and (ii) [redacted] JSUF ¶¶ 15-16. Under *Fujitsu*, Accused Read Channels with [redacted] ***do not have substantial non-infringing uses***. Consequently, LSI's motion for summary judgment of no contributory infringement should be denied.

C. LSI Fails to Establish No Damages as a Matter of Law

LSI attacks UMN's entire damages claim because UMN supposedly cannot recover damages for "HDD products" that "do not directly infringe." Mot. at 20. This is a non sequitur that ignores the facts of the infringement in this case and UMN's actual damages theory.

UMN seeks damages not only, or even principally, for the downstream uses on which LSI focuses (end user uses of commercially available "HDD products" incorporating Accused Read Channels). UMN's damages theory seeks to quantify the value of ***all*** uses of the Asserted Claims, including the myriad uses LSI and its HDD manufacturer customers make during LSI's sales cycle—long before, but absolutely necessary to, any downstream use of commercial products.

Critically, LSI misconstrues the role "HDD products" play in UMN's reasonable royalty damages theory. With method claims like those UMN asserts, ***sales*** is not the infringing act—method claims are infringed only by ***use***. Thus, a hypothetical negotiation must establish an appropriate metric to value those uses. For certain method claims, an appropriate metric might be a royalty rate applied to a royalty base of the number of times the method is performed. Here, however, such an approach does not fit. As UMN's technical expert explained, each time LSI or its customers operate an Accused Simulator or an Accused Read Channel [redacted]

[redacted] Ex. 5 ¶ 6.10. "[Q]uantifying a per use fee" is "nearly impossible" in such circumstances, as the "astronomical numbers [involved] make this method extremely impractical." *CMU*, 986 F. Supp. 2d 574, 636 (W.D. Pa. 2013). Moreover, there is no evidence that LSI or its customers track or count such uses.

Thus, LSI's revenues from SoC sales are the ***metric*** UMN uses to value the infringing acts. UMN's damages expert opines that in light of HDD industry practice and the impracticability of quantifying uses directly, UMN and LSI would have agreed in the hypothetical negotiation to a royalty base consisting of SoC units resulting from sales cycles during which the Asserted Claims were used. Ex. 7 ¶¶ 997-1009. That is an appropriate proxy for the uniquely valuable underlying sales cycle uses, because without sales cycle uses, LSI would not have achieved [redacted] profits. *Id.* ¶¶ 1001-03. As detailed in Section III.A.1, the acts of infringement during the sales cycle were necessary and uniquely valuable to LSI's business irrespective of (i) whether the resulting commercially-available SoCs and HDD products [redacted] or (ii) whether they infringe when operated downstream.

Instead of addressing UMN's actual damages theory, LSI harps on a fundamental misstatement of the law—that "a reasonable royalty cannot include activities that do not constitute patent infringement." Mot. at 20. It is black letter law that non-infringing acts can be used to value infringement in a reasonable royalty analysis. Courts, for instance, have approved (i) use of non-infringing sales used as a proxy for uses of method claims, (ii) recovery for foreign sales with a sufficient tie to underlying domestic infringement, and (iii) recovery for convoyed sales. *See, e.g.*, *CMU*, 807 F.3d at 1304; *Brumfield v. IBG LLC*, 97 F.4th 854, 877 (Fed. Cir. 2024); *Interactive Pictures Corp. v. Infinite Pictures, Inc.*, 274 F.3d 1371, 1385-86 (Fed. Cir. 2001) (allowing bundled and convoyed sales in the royalty base); *see also IPA Techs., Inc. v. Microsoft Corp.*, 18-1-RGA, 2024 WL 1962070 (D. Del. May 2, 2024) (rejecting infringer's "overbroad interpretation" that a royalty base "cannot include activities that do not constitute patent infringement"). Just this year, the Federal Circuit reconfirmed that the hypothetical negotiation can appropriately account for non-infringing activity (in that case, foreign conduct) where "the domestic infringement enables and is

needed to enable otherwise-unavailable profits" arising from the non-infringing conduct. *Brumfield*, 97 F.4th at 877. That level of causation is present here, where infringing uses during the sales cycle are necessary for LSI to [redacted] thereby "enabl[ing] otherwise-unavailable profits." *See supra*. Indeed, in *CMU*, which likewise dealt with infringing uses of read channel technology in a similar sales cycle, both the district court and the Federal Circuit held that sales of SoCs (non-infringing acts) were an appropriate metric to value uses of an infringing method during the sales cycle. 986 F. Supp. 2d at 636-37; 807 F.3d at 1304 ("[A] per-unit royalty [on chips sold] here allow[s] [defendant's] payments to vary with the sales its infringing activity produced, which are a good way of valuing what it was worth to [defendant] to engage in that activity.").[5]

As further detailed in UMN's opposition to LSI's *Daubert* motion and motion to strike UMN's damages expert Catharine Lawton, UMN's damages theory is methodologically sound and solidly grounded in the facts of this case. LSI's arguments fail to address the heart of that theory, to contend with its own infringement, and to apply the governing law. Its bid for summary judgment of no damages should be rejected.

D. LSI Fails to Establish the Asserted Claims Are Not Enabled.

Finally, on enablement, LSI pays no more than lip service to the governing legal standard—whether the '601 Patent teaches the invention "without undue experimentation." And LSI fails to even mention the *Wands* factors used to analyze this standard. *See In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). A proper application of the legal standard demonstrates that disputes of fact preclude summary judgment on enablement.

UMN's technical expert, Prof. McLaughlin, presented a detailed analysis of enablement. Prof. McLaughlin opined on the *Wands* factors: (i) the scope of the claimed invention, (ii) the

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[5] LSI fails to cite either *Brumfield* or *CMU*, and instead relies on inapposite cases in which courts rejected a royalty base that, unlike here, included non-infringing products with no connection to the underlying infringement. *See* Mot. at 21. UMN further addresses those cases in its Opposition to LSI's *Daubert* Motion and Motion to Strike UMN's damages expert Ms. Lawton.

amount of guidance provided by the patent, (iii) the amount of experimentation necessary, (iv) the time and cost of any necessary experimentation, (v) how routine any necessary experimentation is in the field, (vi) whether the patent discloses specific working examples of the claimed invention, (vii) the nature and predictability of the field, and (viii) the level of ordinary skill in the field. Ex. 18, McLaughlin Rebuttal Report, ¶¶ 8.12-8.17. Based on that analysis, Prof. McLaughlin ultimately concluded that "the '601 Patent enables a POSITA to make and use the full scope of the Asserted Claims, including large code rates that are achievable with sophisticated state-dependent codes, without undue or excessive experimentation." *Id.* ¶ 8.11. LSI's technical expert, Dr. Koralek, apparently disagrees with Prof. McLaughlin's conclusion, which creates "a classic 'battle of the experts' that renders summary judgment improper." *Edwards Sys. Tech., Inc. v. Digital Control Sys., Inc.*, 99 F. App'x 911, 921 (Fed. Cir. 2004); *Silicon Labs., Inc. v. Cresta Tech. Corp.*, 14-cv-03227-PSG, 2016 WL 836679, at *5 (N.D. Cal. Mar. 3, 2016) ("This is a classic 'battle of the experts' on a material issue of fact. It is the jury's province to resolve such issues, not the courts").

Rather than addressing the *Wands* factors head-on, LSI harps on the alleged breadth of the Asserted Claims. But just because claims are broad does not mean they are not enabled as a matter of law. The U.S. Supreme Court has made clear that a single example can enable claims with scope broader than the example:

> That is not to say a specification always must describe with particularity how to make and use every single embodiment within a claimed class. For instance, it may suffice to give an example (or a few examples) if the specification also discloses some general quality ... running through the class that gives it a peculiar fitness for the particular purpose. In some cases, disclosing that general quality may reliably enable a person skilled in the art to make and use all of what is claimed, not merely a subset. Nor is a specification necessarily inadequate just because it leaves the skilled artist to engage in some measure of adaptation or testing.

Amgen Inc. v. Sanofi, 598 U.S. 594, 610-11 (2023) (internal quotations and citation omitted)). That is precisely the scenario here: the '601 Patent discloses the general qualities of the claims by providing an embodiment with low-rate block MTR codes. *See* col. 5-6. From that disclosure and others in the '601 Patent, Prof. McLaughlin details why a POSITA can, without undue experimentation, generate high-rate, state-dependent MTR codes that practice the Asserted Claims. Ex. 18 ¶¶ 8.12-8.17. Among other things, Prof. McLaughlin explained that at the time the '601

Patent was filed, there was a well-known, award-winning mathematical algorithm, called the "state-splitting" ("SSA") algorithm, that a POSITA could use to generate any rate constrained code—like MTR codes—up to the maximum rate for the code. *Id.* ¶¶ 6.1-6.24.

LSI's accusation that there are "trillions" of codes covered by the Asserted Claims likewise is a red herring. Mot. at 25. While there are many possible combinations for m, n, j and k values ***in the abstract***, once a code design selects those values (thereby defining the constraints of the code), there is no trial and error necessary. The SSA will ***always*** generate a code that satisfies the selected m, n, j and k values. The SSA might not always result in the optimal code, but it will ***always result in a code that works***; it will not generate countless non-functional codes that must be tried and then discarded. *See* Ex. 18 ¶ 6.17(v). Thus, the theoretical existence of "trillions" of codes does not, as LSI alleges, result in a "research assignment" to a POSITA to wade through them all to find a working one. Mot. at 25. For this reason, *Amgen* is factually inapposite, as in *Amgen* there was no way for a POSITA to know, short of "random trial-and-error" testing the "potentially millions" of covered antibodies, which would actually create the claimed effect. 598 U.S. at 603, 614. Indeed, LSI conspicuously cites only pharmaceutical and biotechnology cases where results can be unpredictable, *see* Mot. at 25, whereas the '601 Patent relates to electrical engineering—a predicable art where enablement requires less disclosure. *See Spectra-Physics, Inc. v. Coherent, Inc*., 827 F.3d 1524, 1533 (Fed. Cir. 1987) ("If an invention pertains to an art where the results are predictable, e.g., mechanical as opposed to chemical arts, a broad claim can be enabled by disclosure of a single embodiment …" (citations omitted)).

Ultimately, it is unclear what precisely LSI's objection to Dr. McLaughlin's "cookbook" argument is, since the test for enablement is whether experimentation is ***undue***, not whether any experimentation is required. But if LSI is arguing that a POSITA could not actually apply the SSA Dr. McLaughlin identifies (his "cookbook") to the disclosures of the '601 Patent to practice high-rate, state-dependent MTR codes, then that is squarely a disputed issue of fact. LSI tries to avoid that consequence by asserting Prof. McLaughlin "effectively admit[ted]" that the '601 Patent does not enable, Mot. at 25, but LSI's argument fails for at least two reasons.

First, the '601 Patent explicitly directs readers to a paper that (i) discloses creating a RLL

code using the SSA and (ii) cites to another paper with a step-by-step process for using the SSA. '601 Patent at col. 2:34-37; Ex. 19, LSI-UMN 00162997; Ex. 18 ¶ 6.13. Prof. McLaughlin opines a POSITA would know of those papers and understand how to use them in conjunction with the '601 Patent to create, without undue experimentation, an MTR code using the SSA. Ex. 18 ¶ 8.15.

Second, even absent that paper citation in the '601 Patent, a POSITA still would be able to create state-dependent MTR codes without undue experimentation, given the state of the art. "[A] specification need not disclose what is well known in the art." *Trustees of Boston Univ. v. Everlight Elecs. Co*., 896 F.3d 1357, 1364 (Fed. Cir. 2018) ("[T]he artisan's knowledge of the prior art and routine experimentation can often fill gaps, interpolate between embodiments, and perhaps even extrapolate beyond the disclosed embodiments, depending upon the predictability of the art."). As Prof. McLaughlin explains, given the numerous, well-known publications about the SSA in the field, a POSITA would know about and be able to use the SSA with the '601 Patent. *See* Ex. 18 ¶¶ 6.11, 6.13, 6.18-19, 6.23. Any disagreements LSI has with Prof. McLaughlin's opinions regarding the POSITA's skill level, the state of the art, and the experimentation required given what the '601 Patent discloses are fodder for cross-examination, not a basis for summary judgment. *See Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 685 (Fed. Cir. 2015) (finding "genuine issues of material fact relating to several of the *Wands* factors, which, taken together, preclude summary judgement of non-enablement").

IV. CONCLUSION

For the foregoing reasons, UMN respectfully asks that this Court deny LSI's Motion.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document has been served on all counsel of record via the Court's ECF system on Nov. 8, 2024.

/s/ Christopher M. Verdini
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